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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/690,921 | 10/21/2003 | Chang-Fu Lin | 60129 (71987) | 6893 |

7590 09/19/2005

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EXAMINER

CLARK, SHEILA V

ART UNIT PAPER NUMBER

2823

DATE MAILED: 09/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/690,921

Applicant(s)

LIN ET AL.

Examiner

S. V. Clark

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 July 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>1/26/04</u> . | 6) <input type="checkbox"/> Other: _____ |

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tosaya et al in view of Toy et al ('576).

Tosaya et al shows in Figure 4 a substrate 112 having a top surface and an opposite bottom surface. At least one chip 114 is shown disposed on the top surface of the substrate and having a heat sink 102 is shown mounted on the top surface of the substrate and connected to the chip via interface material formed thereon (not labeled). Said heat sink is shown to have a flat portion 104 attached to the chip and a support portion 106 extending from an edge of the flat portion and a bonding portion 108 attached to the top surface of the substrate. At least one slot 110 is shown formed through at least one corner of the bonding portion (see also figure 3). Said slot comprising a through hole penetrating the top and bottom surface of the bonding portion of the heat sink. An adhesive material 116 is shown filled in the slot with an over flow of the adhesive material out of the slot and Tosaya et al teaches that the heat sink is attached to the substrate by means of the adhesive material and establishing a riveted connection (see col. 2, line 63).

Tosaya's failure to discuss specifics relative to the chip connection to the substrate is deemed to suggest that the chip may be obviously connected by conventional means such as that shown by Toy et al. Toy shows chip 16 attached to

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heat sink 20, whereby said chip is electrically connected to substrate 10 via a plurality of conductive elements 14 (i.e. solder balls) and the substrate may be formed with solder balls 32 (can be BGA-see col. 4, lines 35) mounted on the bottom surface of the substrate. It would have been therefore obvious to one having ordinary skill in this art the provide the bottom surface of the chip of Tosaya with conductive elements and the bottom surface of the substrate with solder balls in view of the teachings of Toy et al who teaches the common convention and because Tosaya's failure to discuss specifics relative to the chip connection to the substrate is deemed to suggest that the chip may be obviously connected by conventional means.

Tosaya's failure to discuss specifics relative materials is deemed to obviously suggest that conventional materials may be utilized such as those shown by Toy et al. Toy et al uses also an adhesive to anchor heat sink 20 and teaches that said adhesive may be formed of many types of materials such as elastomers (col. 1, line 16), solder (col. 8, line 25) and also teaches forming heat sink 20 attached to the chip via and adhesive 28 (col.6, thermal paste) and said substrate 10 may be made of plastic material which is deemed to obviously include conventional substrate material such as polyimide. It would have been therefore obvious to one having ordinary skill in this art to use the material recited in the claims in the invention of Tosaya in view of the teachings of Toy et al who teaches the common convention and because Tosaya's failure to discuss and therefore limit his invention to specific materials is deemed to suggest that conventional materials may be utilized.

The obvious used of underfill or insulating materials filling the gaps between solder bumps is also taught by Toy et al.

Rivet and anchoring effect of the adhesive fill is taught in col. 2, line 63 and 67 of Tosaya et al.

Claim 8 contains a method of making characteristics (i.e. made by stamping) give no patentable weight in determining the patentability of the final device product.

Note that a Aproduct by process= claim is directed to the product per se, no matter how actually made, In re Hirao 190 USPQ 15 at 17(footnote 3). See also In re Brown, 173 USPQ 685; In re Luck, 177 USPQ 523; In re Fessman, 180 USPQ 324; In re Avery, 186 USPQ 161 and In re Marosi et al, 218 USPQ 289, all of which make it clear that it is the patentability of the final product per se which must be determined in Aproduct by process= claims, and not the patentability of the process, and that, as here, an old or obvious product produced by a new method is not patentable as a product, whether claimed in Aproduct by process= claims or not.

With regard to claims 12-18 Tosaya et al clearly teaches use of slots shaped as a rivet to provide an anchoring effect. Tosaya et al further teaches that said slots may have varying shapes (see col. 2, lines 55-56) and therefore obviously including any shape which allows for the riveting anchoring effect, including those recited in the claims.

Claims 1-18 are rejected.

Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication should be directed to S. V. Clark at telephone number (571) 272-1725.



S. V. Clark
Primary Examiner
Art Unit 2823

September 13, 2005